

TROUBLESHOOTING MANUAL

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Troubleshooting Manual

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troubleshooting Manual

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A troubleshooting flow chart is created for the purpose of repairing the ML390 FLATBED printed circuit board assemblies. Those who are engaged in the repair work are expected to have an adequate level of experience and ability.

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The following tools are required for ordinary repair work in addition to generally used tools.

Oscilloscope	Approximately 100 MHz
Soldering iron	Any soldering iron available on the market (preferably with a pointed tip) A special soldering iron set can be used to work more efficiently.

Troubleshooting Items

One of the operating voltages is missing.

- (1-1) There is no +40V output.
- (1-2) There is no +8V output.
- (1-3) There is no +5V output.
- (1-4) There is no 10V AC output.
- (1-5) There is no output.

Only the power lamp is illuminated.

Printer alarm occurs.

These errors are indicated by lit LEDs on the operator panel.

- (3-1) Internal RAM error
- (3-2) Program ROM error
- (3-3) EEPROM error
- (3-4) Resident CG ROM error
- (3-5) Card CG ROM error
- (3-6) External RAM error
- (3-7) Head homing or spacing error

Printing wrong character or some characters are not printed.

Malfunction of line feed

⑥ The printing operation is not performed after an operating switch is pressed.

6-1 The SELECT switch does not function.

6-2 The MODE switch does not function.

6-3 The LF switch does not function.

6-4 The FF switch does not function.

6-5 The PARK switch does not function.

⑦ The data cannot be received.

7-1 The parallel interface data cannot be received.

7-2 The parallel interface data is received but printing data is missing or printing operation is not performed.

ne of the operating voltages is missing.

1-5 There is no +40V output. (But there is +5V output.)

• Q1 emitter – The voltage between pins 4 and 5 of CN2 (0V) is 40V to 70 V?
(Power supply printed circuit board)

• Yes The waveform of pin 2 of IC2 is as shown in Figure 1?
(Power supply printed circuit board)

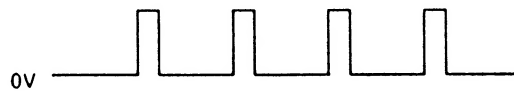


Figure 1

• Yes Replace Q1 or Q2.

• No Replace IC2 or IC3.

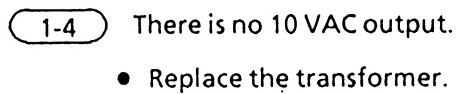
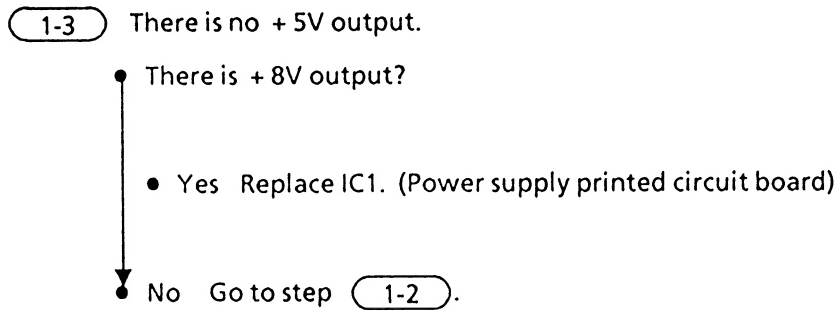
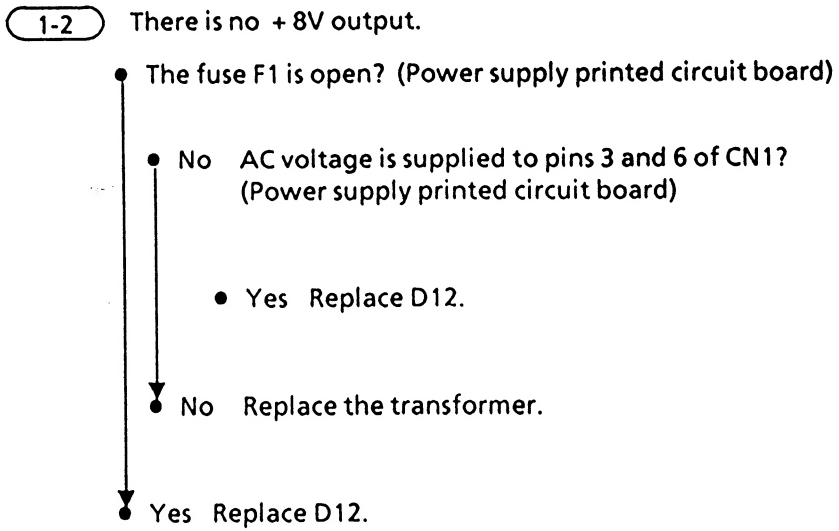
• No AC voltage is supplied to pins 1 or 2, and 7 or 8 of CN1?
(Power supply printed circuit board)

• Yes Replace D1.

• No The fuse on the filter board is open?

• Yes Go to step 1-5.

• No Replace the transformer.



○ There is no output.

● The fuse on the filter board is open?

● No Replace the transformer.

▼ Yes The signal is input to pin 12 of CN5? (Control printed circuit board)

● Yes The D 506 cathode voltage is approximately 13V?

● No Replace TR 504 or TR 503.

▼
● Yes Go to step ③ or ④.

▼ No A short circuit exists between the emitter and collector of Q1?
(Power supply printed circuit board)

● Yes Replace Q1.

▼ No A short circuit exists between the anode and cathode of D2?
(Power supply printed circuit board)

● Yes Replace D2.

▼ No A short circuit exists in D1? (Power supply printed circuit board)

● Yes Replace D1.

▼ No Replace the transformer.

② Only the power lamp is illuminated. (The printing operation is not performed at all.)

• The oscillation waveform of OSC is the same as shown in Figure 2?

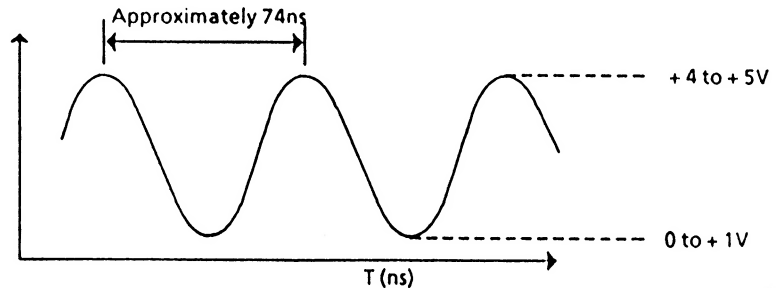


Figure 2

• No Replace the OSC or R36.

• Yes The input waveform on pin 15 of 03B is the same as shown in Figure 3?

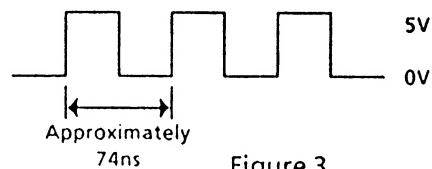


Figure 3

• No Replace 03C (MSM79H097).

• Yes The RST signal on pin 4 of 03B is the same as shown in Figure 4?

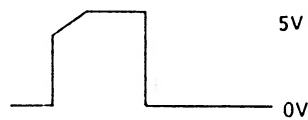


Figure 4

• No The output waveform of pin 1 on 02F is the same as shown in Figure 4?

• Yes Replace 02B (MSM6990).

• No The input waveforms of pin 6 and 7 of 02B are shown in Figure 5?

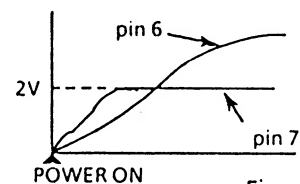


Figure 5

• Yes Replace 02F.

• No Replace the elements of the input signals of pins 6 and 7 of 02B.

• Yes The ALE, PSEN, RD, WR and BUS signals of 03B are the same as shown in Figure 6?

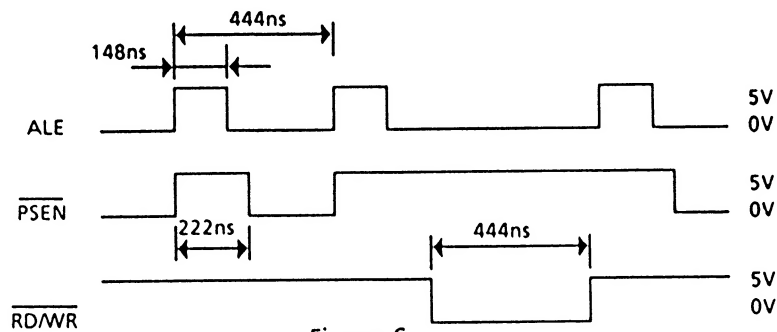


Figure 6

The signal level of the bus line should be stabled to high or low level at the full of PSEN or at the rise of RD/WR.

- No Replace 03B.

- Yes The LAMP SD, LAMP SD CLK signal of 03B is the same as shown in Figure 7?

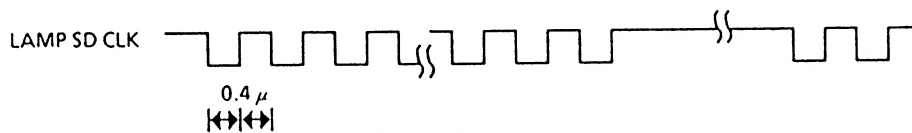


Figure 7

The signal level of LAMP SD should be stabled to high or low level at the rise of SD CLK.

- No Replace 03B.

- Yes Replace CN1.

③ Printer alarm occurs.

3-1 Internal RAM error

- Replace 03B.

3-2 Program ROM error

- Replace 03A.

3-3 EEPROM error

- The DATA IN and CS signal levels of 03B is the same as shown in Figure 8?

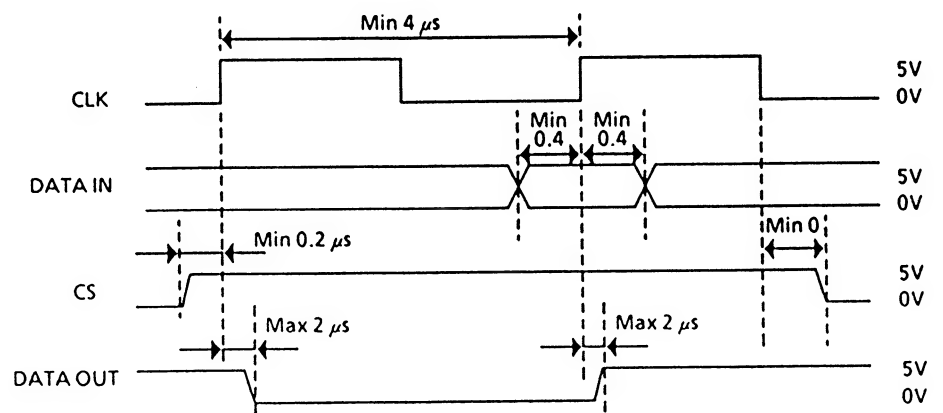


Figure 8

- No Replace 03B.
- Yes Replace 02A.

1) Resident CG ROM error

- The CS12 (pin 80), ROM READ (pin 49) and BUS signals of 03C are the same as shown in Figure 9?

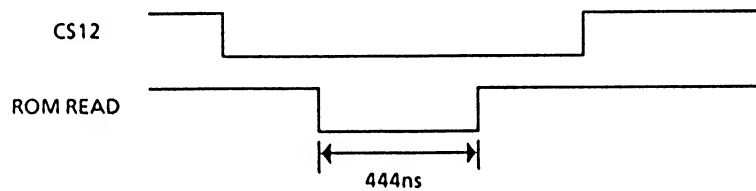


Figure 9

The DATA bus signal should be stabled to high or low level at the rise of ROM READ.

- No Replace 03C.
- Yes Replace 01D.

5) Card CG ROM error

- Replace the font card.

6) External RAM error

- The RAS (pin 57), CAS1 (pin 54), RAM WR (pin 52), RAM OE (pin 51) and RAD 0-7 and DRAM A7-0 of 03C are the same as shown in Figure 10?

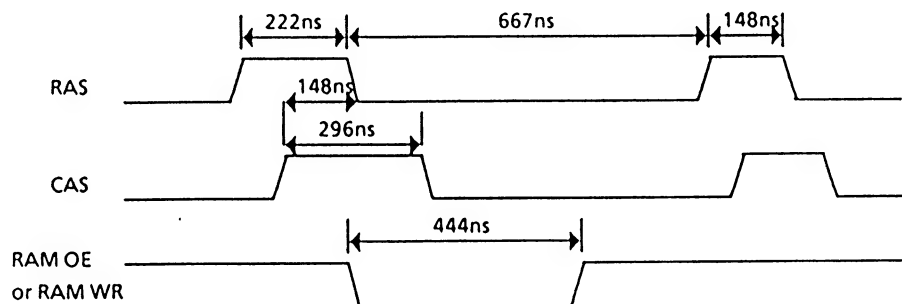


Figure 10

The signal levels of RAD 0-7 and DRAM A0-7 should be stabled to high or low level at the rise of RAM OE or RAM WR.

- No Replace 03C.
- Yes Replace 03D or 03E (D-RAM).

3-7 Head homing or spacing error

The waveforms of SPU (pin 61), SPV (pin 62) and SPW (pin 63) of 02B are the same as shown in Figure 11?

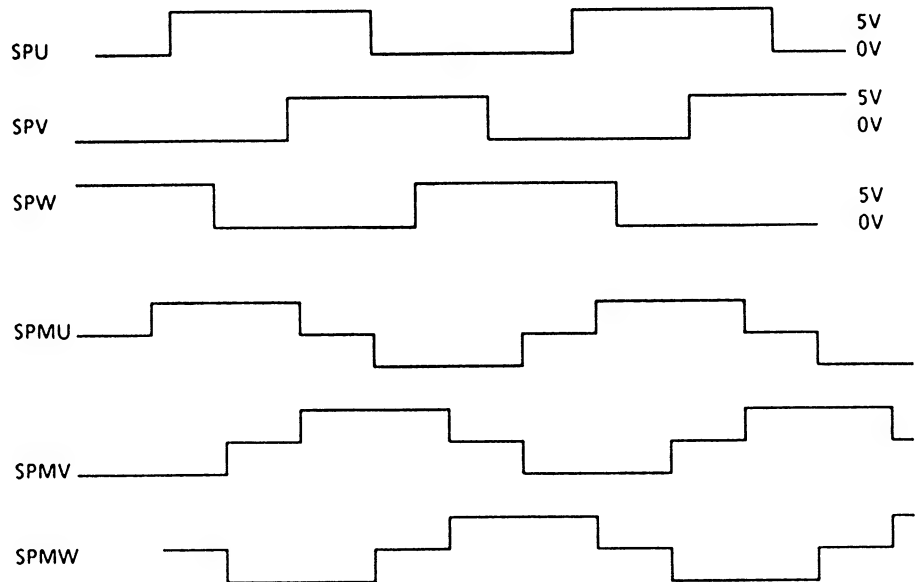


Figure 11

The cycle of SPDA should be $64\mu s$ and the rectangular wave should be output.

- No The input waveforms of PHASE A (pin 79) and PHASE B (pin 80) of 02B are the same as shown in Figure 12? (Move the carriage manually if the operation is stopped.)

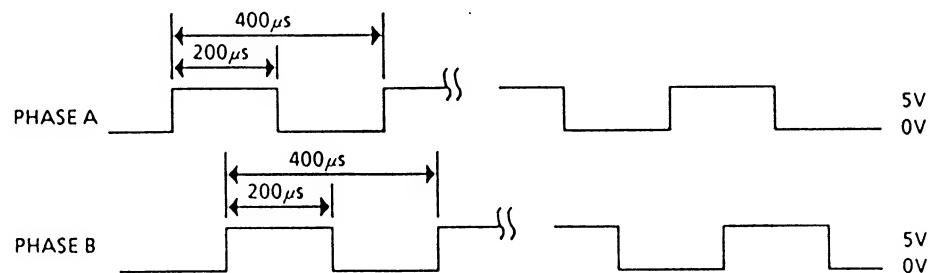
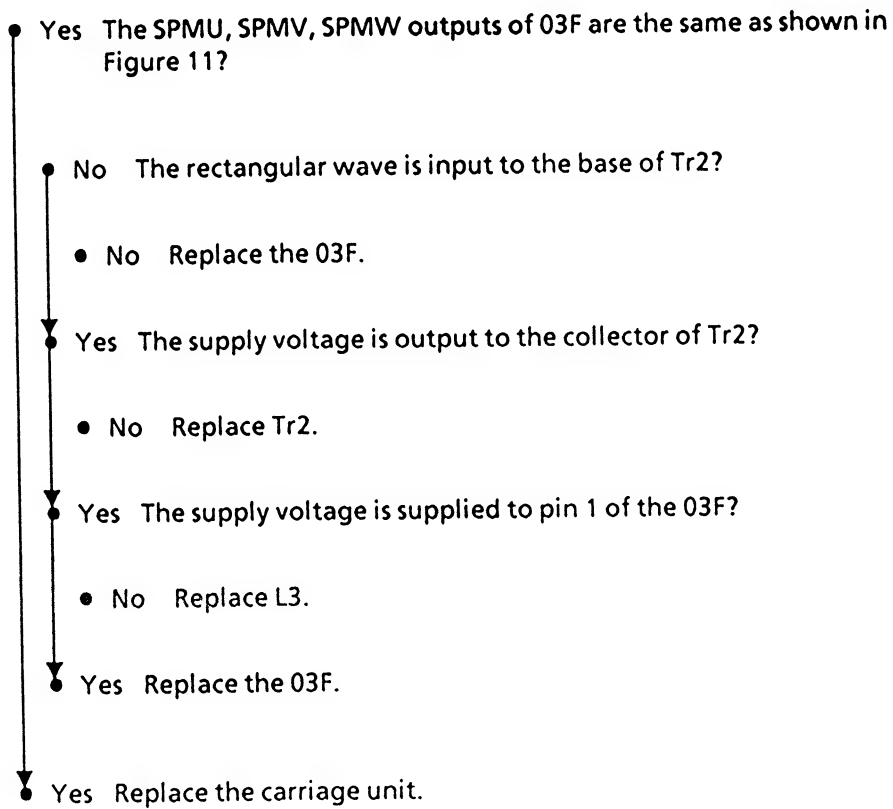


Figure 12

(The above diagram shows the timing during constant-speed operation.)

- No Replace the carriage unit or space motor.
- Yes Replace 02B.



④ Printing wrong character or some characters are not printed.

The RAS (pin 57), CAS 1 (pin 54), ROM READ (pin 49), RAM OE (pin 51), RAM WR (pin 52), CS, ROM A0-15, DRAM A0-7, RAD 0-7 signals of 03C are the same as shown in the Figure 13? In other words, DMA operation of ROM to RAM and RAM to RAM is normal?

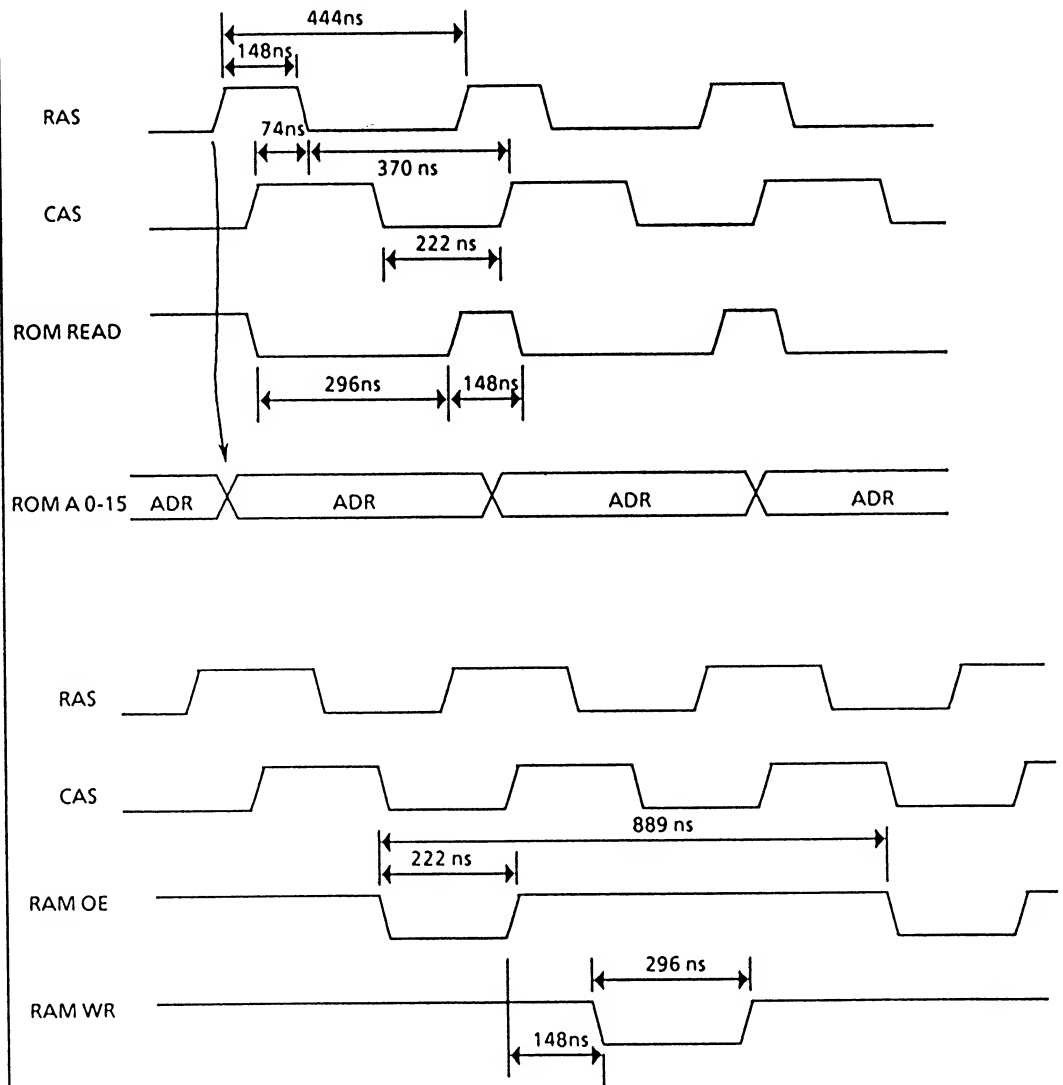


Figure 13

The DRAM A0-7 should be stabled to high or low level at the fall of CAS.
The RAD 0-7 should be stabled to high or low level at the fall of CAS and at the rise of RAM OE.

• No Replace 03C.

• Yes When the on-line graphic printing ("FF") is performed, the S DATA, S-CLOCK, HD OFF and HDDV signals are the same as shown in Figure 14?

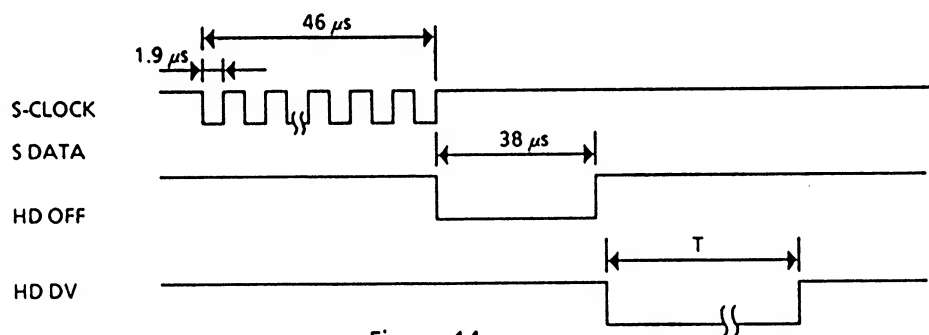


Figure 14

T: Variable by the firmware setting

- No Replace 03C.

Yes The output waveforms of pins 13 and 14 of the comparator 02F are the same as shown in Figure 15?

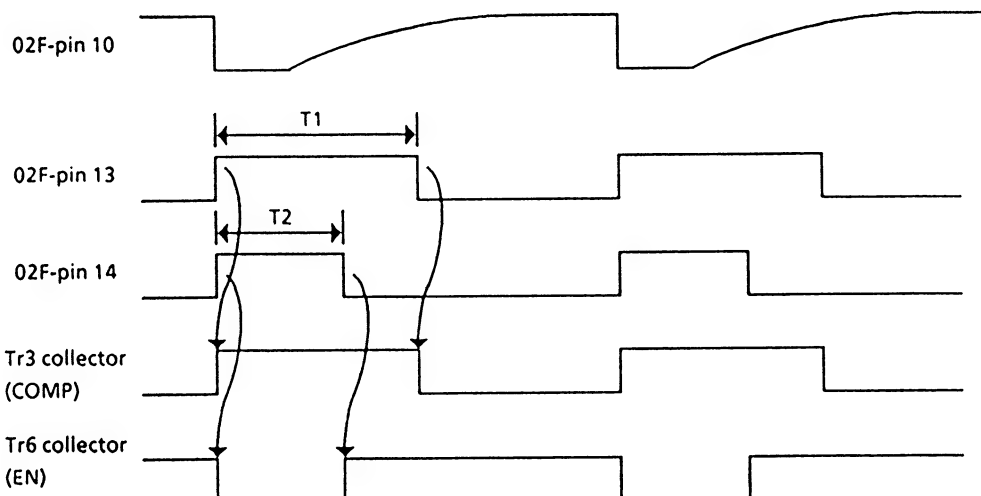


Figure 15

The T1 and T2 are variable by the firmware setting.

- No Replace 02F.

Yes The COMP and EN signals are the same as shown in Figure 15?

- No Replace Tr7 and Tr3, or Tr6.

Yes Replace the carriage unit.

⑤ Malfunction of line feed

- The LF PHA and LF PHB signals of 02B are the same as shown in Figure 16?

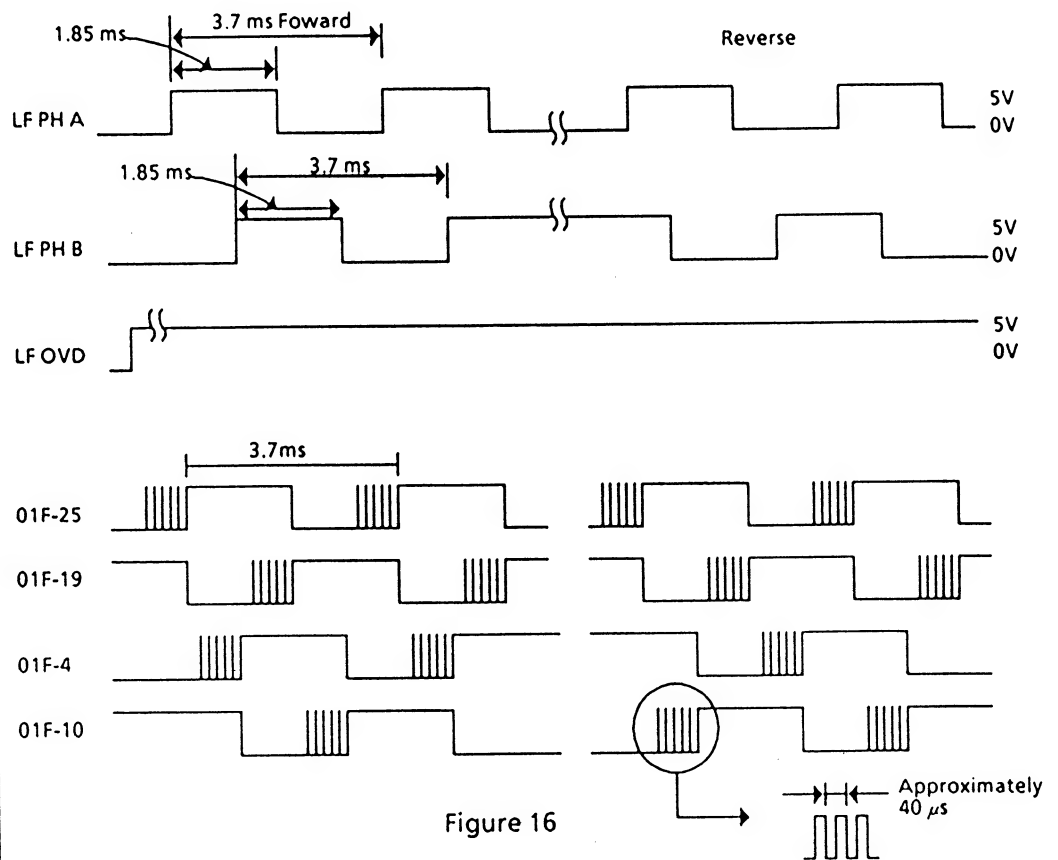


Figure 16

- No Replace 03C.
- Yes The waveform of LF OVD is the same as shown Figure 16 during constant-speed operation?
 - No Replace 02B.
 - Yes The VR1/VR2 voltage of pins 2 and 27 of 01F are approximately 3.2V?
 - No Replace one of the input elements (Tr1,Tr4,Tr5,Tr501 or Tr502) of VR1 or VR2.
 - Yes The waveform of pins 4, 10, 19 and 25 of the 01F are the same as shown in Figure 16?
 - No Replace 01F.
 - Yes Replace either LF motor or LF motor interconnect module.

the printing operation is not performed after the operating switch is pressed.

1) The SELECT switch does not function.

- The SEL SW signal on pin 49 of 02B is set low when the SEL SW is pressed?
 - No Replace either one of the elements of the SEL SW or CN2.
 - Yes Replace 02B.

2) The MODE switch does not function.

- The MODE SW signal of 02B is set low when the MODE SW is pressed?
 - No Replace either one of the elements of the MODE SW or CN2.
 - Yes Replace 02B.

3) The LF switch does not function.

- LF operation is performed in online condition?
 - No Go to step ⑤.
 - Yes The LF SW signal of 02B is set low when LF SW is pressed?
 - No Replace either one of the elements of the LF SW or CN2.
 - Yes Replace 02B.

6-4

The FF switch does not function.

- FF operation is performed during online?
 - No Go to step ⑤.
- ▼
- Yes The FF SW signal is set low when FF SW is pressed?
 - No Replace either one of the elements of the FF SW signal or CN2.
- ▼
- Yes Replace 02B.

6-5

The PARK switch (SET TOF, PRINT, PRINT QUALITY, CHARACTER and PITCH switches) does not function.

- The PARK SW signal is set low when PARK SW is pressed?
 - No Replace the PARK SW or CN2.
- ▼
- Yes Replace 02B.

he data cannot be received.

1 The parallel interface data cannot be received.

- The IF DATA 8-1 of 02B (MSM6990) is the same as shown in Figure 17?

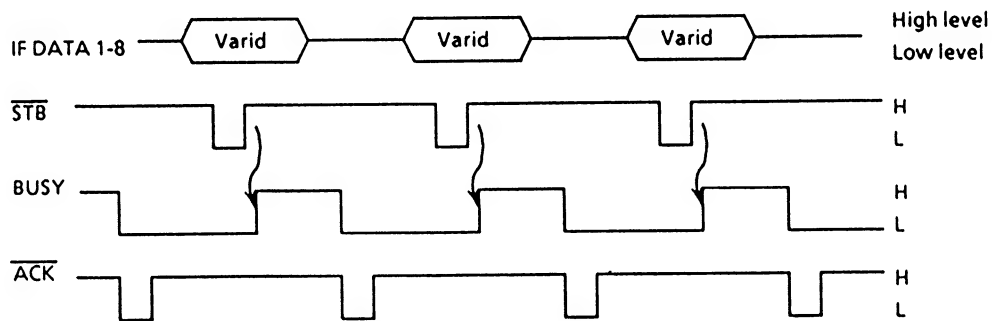


Figure 17

- No Replace either resistor of IF DATA 1-8 signals or the CN1.
- Yes The \overline{STB} signal (pin 2) of 02B is the same as shown in Figure 17.
 - No Replace either resistor or capacitor of the \overline{STB} signal.
- Yes The BUSY signal (pin 68) or ACK signal (pin 69) of 02B is the same as shown in Figure 17?
 - No Replace 02B.
- Yes Replace 04B.

2 The parallel interface data is received but printing data is missing or printing operation is not performed.

- Gap occurs during self-test.
 - Yes Go to step ④.
- No The BUSY (pin 68) or ACK (pin 69) signal of 02B is the same as shown in Figure 17?
 - Yes Replace 02B.
- No Replace either 04B or resistor of ACK or BUSY signal.

COMPONENT PARTS LIST

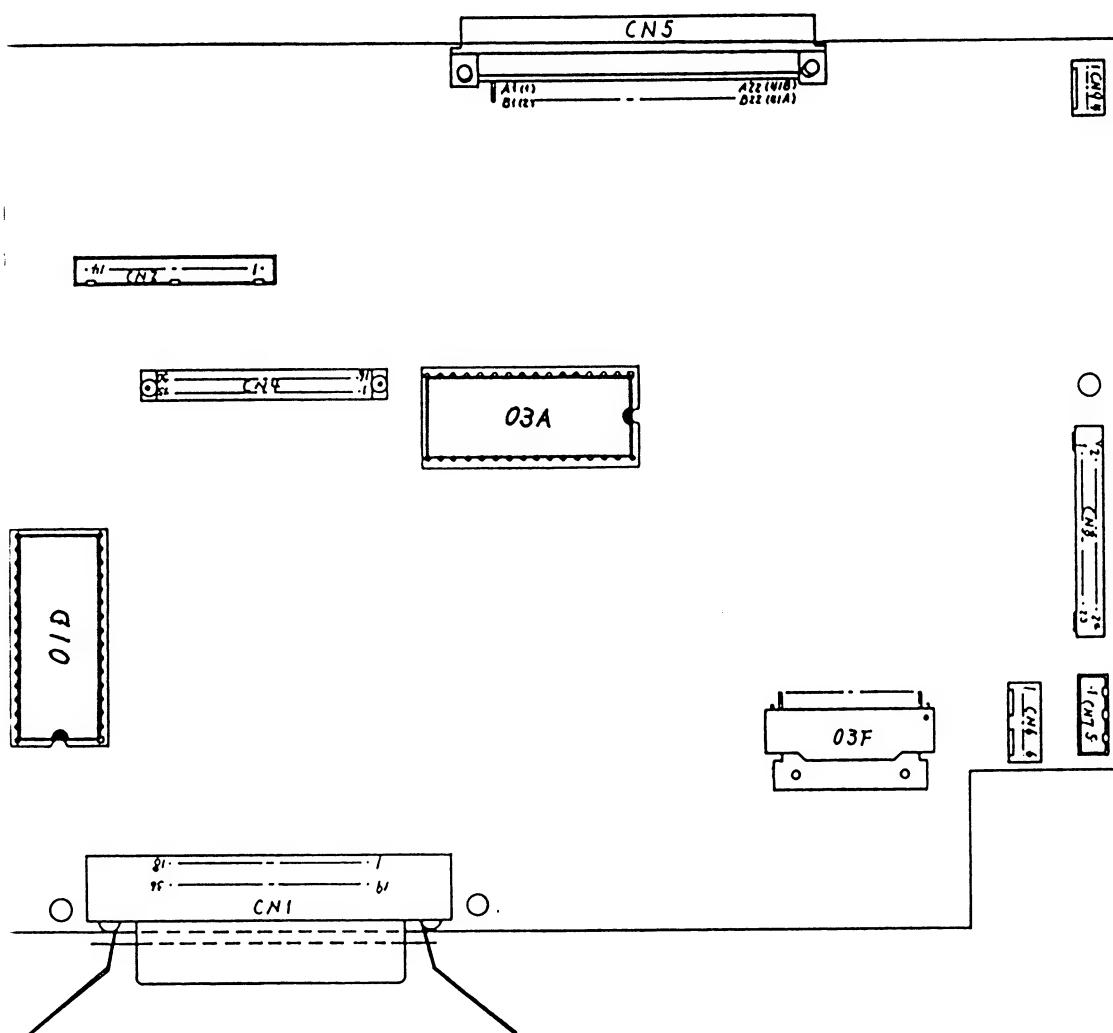
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Component Parts List

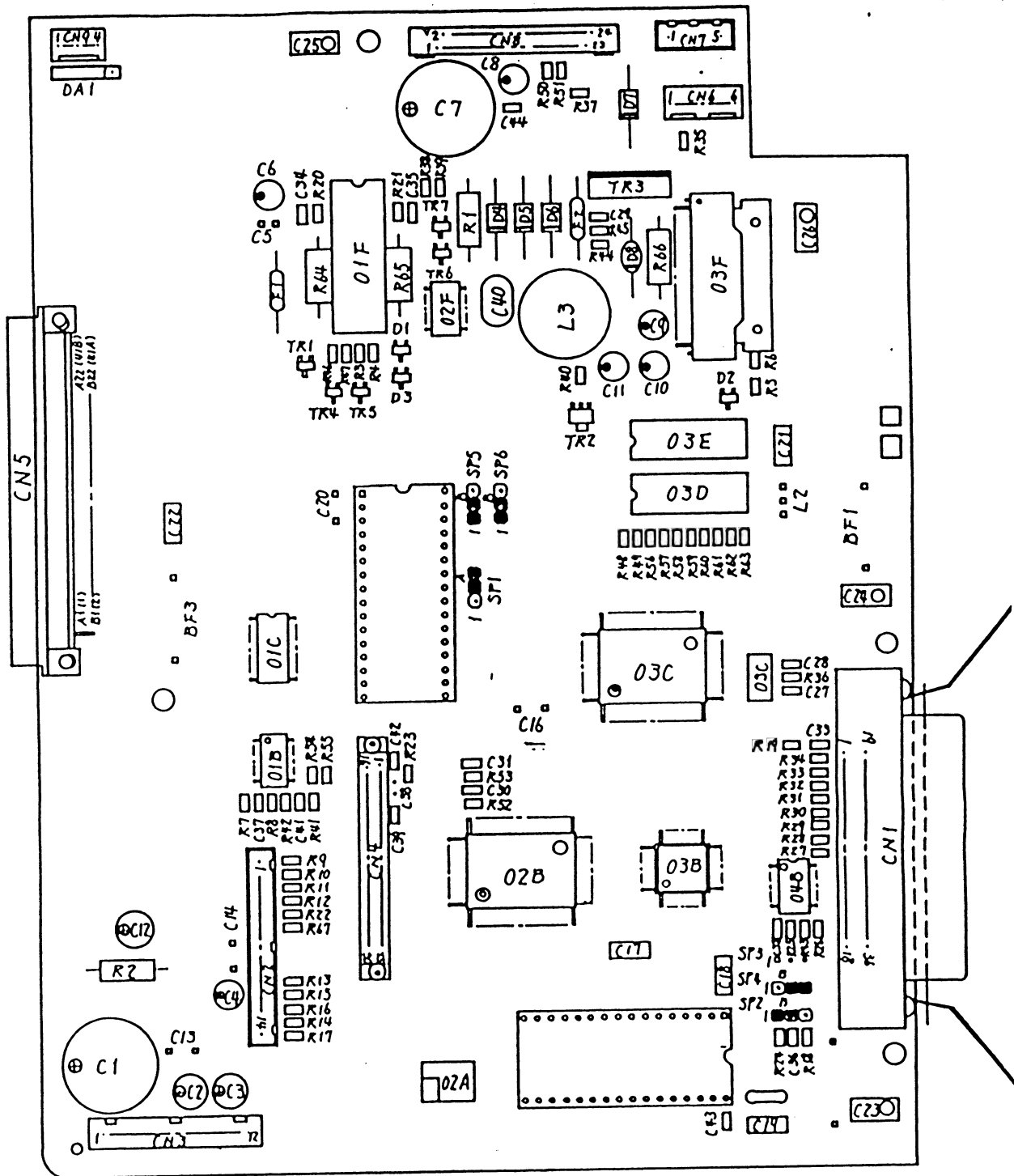
SHPX - 2 Printed Circuit Board	4YA4053-2290GXXX	2-1
SHPO - Printed Circuit Board	4YA4053-2291G1	2-9
SUII - Printed Circuit Board	3YU5057-3311G1	2-11
MIIF - Printed Circuit Board (Option I/F Board)	2YU5005-1726G1	2-15

f ROM identification for each G. NO.

ROM NO.	ROM code NO.	ROM code NO.	Use	Remarks
01D	817A2633M0189		ML390FB OEL	EI compatible
03A	4YR4084-7058G1	84-7058		
01D	_____		ML390FB OEL	Without ROM for maintenance
03A	_____			



SHPX - 2 Printed Circuit Board (4YA4053-2290GXXX) 1/2 (1/2)



SHPX - 2 Printed Circuit Board (4YA4053-2290GXXX) 1/2 (2/2) Rev.2

Printed Circuit Board (4YA4053-2290GXXX) 2/2 (1/6) Rev.2
G102

Symbol	Type/Name	Part No.	Q'ty	Remarks
D1	IB25-03-479 Diode array	761A2234M0001	1	
D502	MA3056-M Zener DI (CP)	613A0291M0122M	1	
D8	DFAlA1 Rectifier DI	610A0221L0021	1	
D4-7	EM01Z/SM1XN02/DSM1D2 Rectifier DI	610A0003M0001	4	
D1,501,505, D09	MA151WK/DAN202K Signal DI (CP)	611A0003N0003	4	
D504	MA152WA Signal DI (CP)	611A0029M0002	1	
D507	RD2.7M-B1 Zener DI (CP)	613A0233M0042A	1	
D3,506	MA3047-H Zener DI (CP)	613A0291M0102H	2	
D503	MA3120 Zener DI (CP)	613A0291M0202	1	
D2	MA3240-M/RD24M-B2 Zener DI (CP)	613A0103M0272B	1	
D508	MA3330-M Zener DI (CP)	613A0291M0302M	1	
R508,511-513	RM73B2A101J RN resistor (CP)	323A5003J0101	4	
R41	RM73B2A271J RN resistor (CP)	323A5003J0271	1	
R538-545	RM73B2A331J RN resistor (CP)	323A5003J0331	8	
R563-573	RM73B2A431J RN resistor (CP)	323A5003J0431	11	
R574	RM73B2A471J RN resistor (CP)	323A5003J0471	1	
R48,49,577- 579	RM73B2A511J RN resistor (CP)	323A5003J0511	5	
R56-63,591, 592-607	RM73B2A681J RN resistor (CP)	323A5003J0681	25	

SHPX - 2 Printed Circuit Board (4YA4053-2290GXXX) 2/2 (2/6) Rev.2
For : G2, G102

No.	Symbol	Type/Name	Part No.	Q'ty	Remarks
19	R9-12,14-22, 509,510,514- 520	RM73B2A102J RN resistor (CP)	323A5003J0102	22	
20	R37	RM73B2A122J RN resistor (CP)	323A5003J0122	1	
21	R527	RM73B2A182J RN resistor (CP)	323A5003J0182	1	
22	R528-531	RM73B2A202J RN resistor (CP)	323A5003J0202	4	
23	R38-40,535, 536	RM73B2A222J RN resistor (CP)	323A5003J0222	5	
24	R43-45,546- 562	RM73B2A332J RN resistor (CP)	323A5003J0332	20	
25	R50,51,67, 581-583	RM73B2A512J RN resistor (CP)	323A5003J0512	6	
26	R52-55,584- 590	RM73B2A562J RN resistor (CP)	323A5003J0562	11	
27	R608,609	RM73B2A682J RN resistor (CP)	323A5003J0682	2	
28	R13,23-35, 521,522	RM73B2A103J RN resistor (CP)	323A5003J0103	16	
29	R532-534	RM73B2A203J RN resistor (CP)	323A5003J0203	3	
30	R42	RM73B2A303J RN resistor (CP)	323A5003J0303	1	
31	R46,47	RM73B2A363J RN resistor (CP)	323A5003J0363	2	
32	R575,576	RM73B2A473J RN resistor (CP)	323A5003J0473	2	
33	R610	RM73B2A683J RN resistor (CP)	323A5003J0683	1	
34	R523,524	RM73B2A104J RN resistor (CP)	323A5003J0104	2	
35	R526	RM73B2A124J RN resistor (CP)	323A5003J0124	1	
36	R537	RM73B2A224J RN resistor (CP)	323A5003J0224	1	

Printed Circuit Board (4YA4053-2290GXXX) 2/2 (3/6) Rev.2
2, G102

Symbol	Type/Name	Part No.	Q'ty	Remarks
R36,525	RM73B2A105J RN resistor (CP)	323A5003J0105	2	
R5,6,502,504	RM73B2A242F RN resistor (CP)	323A5003F0242	4	
R505	RM73B2A302F RN resistor (CP)	323A5003F0302	1	
R507	RM73B2A332F RN resistor (CP)	323A5003F0332	1	
R501	RM73B2A124F RN resistor (CP)	323A5003F0124	1	
R3,4	RM73B2A154F RN resistor (CP)	323A5003F0154	2	
R7	RM73B2A331F RN resistor (CP)	323A5003F0331	1	
R8	RM73B2A621F RN resistor (CP)	323A5003F0621	1	
R64-66	MSF1/2B0.51ΩJ RS resistor (CP)	324A1001J0518	3	
R2	RD1/2Y2KΩJ RD resistor (CP)	321A1431J0202	1	
R1	RD1/2Y1.2KΩJ RD resistor (CP)	321A1431J0122	1	
C30,31,502-517	CC2012SL1H101J 50V CC capacitor (CP)	303A3007K0101	18	
C34,35,519,520	CC2012SL1H821J 50V CC capacitor (CP)	303A3007K0821	4	
C36,521	CK2012B1H102K 50V CK capacitor (CP)	303A6008K3102	2	
C37,522-529	CK2012B1H103K 50V CK capacitor (CP)	303A6008K3103	9	
C41-44,531,532,534-537,539-546,548,549,552,553	CK2012F1H104Z 50V CK capacitor (CP)	303A6008Z3104	22	
C39,530	CK2012R1H223K 50V CK capacitor (CP)	303A6008K3223	2	

SHPX - 2 Printed Circuit Board (4YA4053-2290GXXX) 2/2 (4/6) Rev.2
For : G2, G102

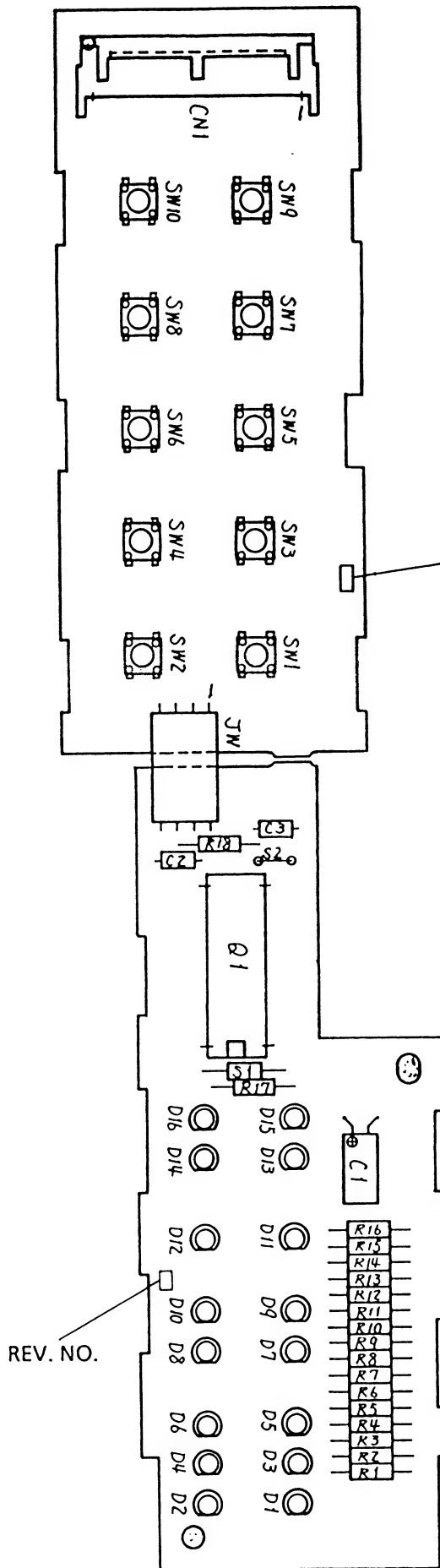
No.	Symbol	Type/Name	Part No.	Q'ty	Remarks
54	C27-29	CC2012CH1H100D 50V CC capacitor (CP)	303A3007C0100	3	
55	C33	CC2012SL1H561J 50V CC capacitor (CP)	303A3007K0561	1	
56	C32	CC2012SL1H471J 50V CC capacitor (CP)	303A3007K0471	1	
57	C17-19,21,22	CK92F1E105ZS 25V CK capacitor 1 μ F	303A4117Z2105	5	
58	C1,7	SRC50VB-680(M) 50V CE capacitor 680 μ F	304A1035H1681	2	
59	C40	CQMF92PP2A223G-F0 CQ capacitor 0.022 μ F	306A4103G2223	1	
60	C6,10,11	CEUSM1H100 CE capacitor 10 μ F	304A1041H1100	3	
61	C23-26	TCK45F2E103ZYA 250V CK capacitor 10000PF	302A4027Z5103	4	
62	C4,8,9	CEUSM2A3R3 100V CE capacitor 3.3 μ F	304A1041A2339	3	
63	C2	CEUSM1A101 10V CE capacitor 100 μ F	304A1041A1101	1	
64	C3,12	CEUSM1E470 25V CE capacitor 47 μ F	304A1041E1470	2	
65	O3B	MSM80C154VGS-V1K-1 MOS-CPU (FP)	851A0124N0013	1	
66	O3C	MSM79H097GS-V1K MOS digital IC (FP)	702A4824N9029	1	
67	O2B	MSM6990GS-V1K MOS digital IC (FP)	702A2024N0003	1	
68	O3D,O3E	464P-12 MOS-D-RAM	802A2003M8302	2	
69	O3F	HA13412 BIP linear IC	720A4021E0004	1	
70	O1F	M54646AP BIP linear IC	720A1822M0002	1	
71	O2A	MSM16811RS-NW MOS-EEPROM	816A0322F0000	1	

Printed Circuit Board (4YA4053-2290GXXX) 2/2 (5/6) Rev.2
2, G102

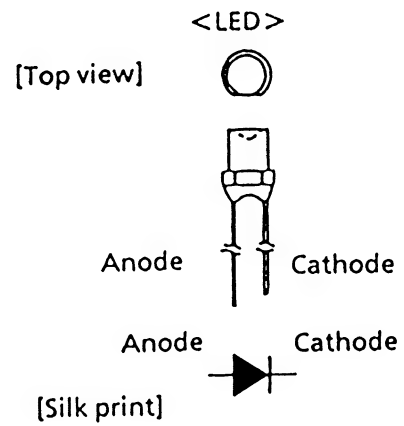
Symbol	Type/Name	Part No.	Q'ty	Remarks
J4B	74LS06FP BIP digital IC (SO)	700A0503N0006	1	
Q1B, Q2F	NJM2901M/UPC339G2 BIP linear IC (SO)	700A0503N0007	2	
Q1C	74LS245FP BIP digital IC (SO)	700A0503N0245	1	
L3	RSL1513N102K/OL1614 H coil	353A3040K0102	1	
L1	DSS306-OAFZ103N EM filter	342A1009P3103	1	
TR1, 501, 503, 507, 508	A1344/UN2111/DTA114K PNP-HF-TR (CP)	600A1003N0003	5	
TR2	2SB1123 PNP-LF-TR (CP)	601A1032N0002	1	
TR4-7, 502 504-506	2SC3361/2SC2412K NPN-HF-TR (CP)	602A1003N0002	8	
TR3	2SB883 PNP-LF-TR	601A1232M0001	1	
SP-1, 2, 4, 5, 6	FFC-3AMEP2 FC connector	225A3115P0030	5	
	DIC-S252 PC connector	224A3182P0021	5	
			2	
CN1	57RE-40360-730B-D29A Square type connector	220A1783P0360	1	
CN2	DF1B-14P-2.5DSA PC connector	224A3716P0140	1	
CN3	DF1B-12P-2.5DSA PC connector	224A3716P0120	1	
CN4	00-9072-230-101-883 PC connector	224A3376P0300	1	

SHPX - 2 Printed Circuit Board (4YA4053-2290GXXX) 2/2 (6/6) Rev.2
For: G2, G102

No.	Symbol	Type/Name	Part No.	Q'ty	Remarks
87	CN5	00-8272-244-001-112 PC connector	224A3368P0440	1	
88	CN6	00-8263-0612-00-000 PC connector	224A3357P0060	1	
89	CN7	DF1B-5P-2.5DSA PC connector	224A3716P0050	1	
90	CN8	Z-355S PC connector	224A3198P0240	1	
91	CN9	00-8263-0412-00-000 PC connector	224A3357P00040	1	
92		DICF-32CS-E IC socket	245A1221P0320	2	
93	OSC	FAR-C4SB13500000M02A Piezoelectric vibrator	381A2001B0006	1	
94	F1,F2	251-001 Fuse	540A2208S1102	2	
95		Varnish tube (black) L=4	4PP4010-1002P004	4	



(Note 1) The LED (D1-D16) should be mounted, matching the polarity to the silk-printed patterns as shown below.

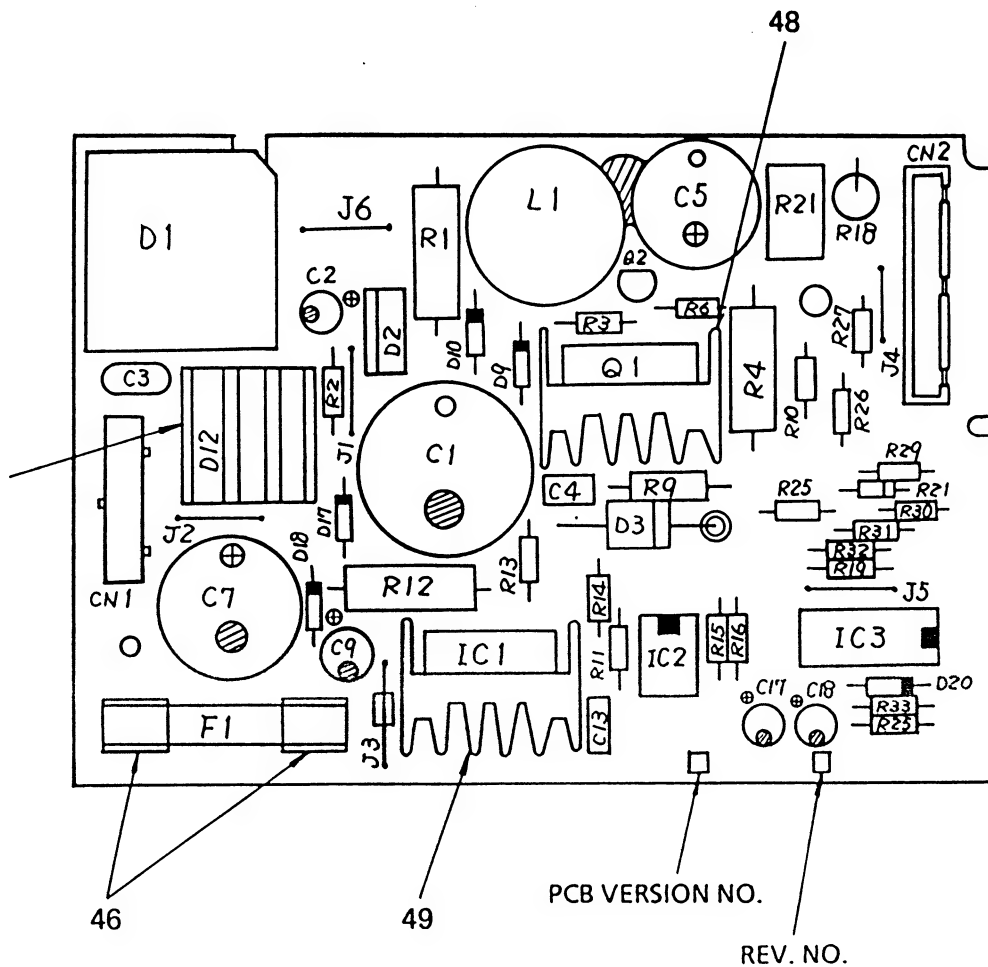


PCB VERSION NO.	1
REV. NO.	1

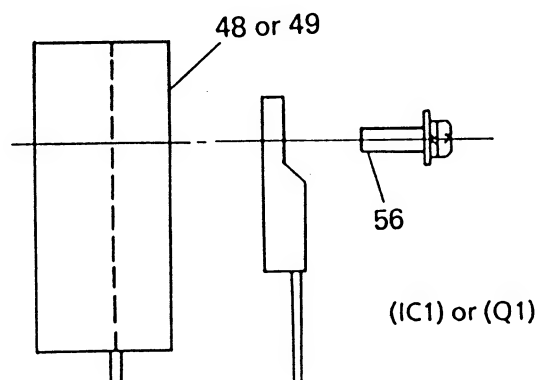
SHPO-Printed Circuit Board (4YA4053-2291G1) 1/2

SHPO - Printed Circuit Board (4YA4053-2291G1) 2/2 (1/1) Rev.1

No.	Symbol	Type/Name	Part No.	Q'ty	Remarks
1	R2-16	RD1/4Y110ΩJ RD resistor	321A1421J0111	15	
2	R1	RD1/4Y150ΩJ RD resistor	321A1421J0151	1	
3	R17,18	RD1/4Y5.6KΩJ RD resistor	321A1421J0562	2	
4	SW1-10	SOA-113HS Leaf switch	205A1162P1001	10	
5	C1	CEUSM1H100 50V CE capacitor 10μF	304A1041H1100	1	
6	C2	FK16COG1H101J 50V CC capacitor 100PF	303A1014C3101	1	
7	C3	FK16Y5R1H103K CK capacitor	303A4019K3103	1	
8	D3	GL3HD47 LED	650A0128M0022	1	
9	D1,2,4-16	GL3HY47-B,C (LT3H477) LED	650A0228M0007	15	
10	Q1	MSM59371RS CPU-INF-IC	855A0824F0014	1	
11	CN1	DF1B-14P-2.5DS PC connector	224A3717P0140	1	
12	JW	V2RJ-D-OM-1SX4X95 Jumper	238A1043P0021	1	
13	S1	JPW02 Jumper wire	321A1520P0001	1	
14	S2	Shorting wire (U type) 0.65 P=5.0	5KH-31036-50	1	



(Note 1) Details for mounting the IC1



SUII-Printed Circuit Board (3YU5057-3311G1)
REV.1 PCB version 1

SUII - Printed Circuit Board (3YU5057-3311G1) 2/2 (1/3) REV. 1 PCB version 1

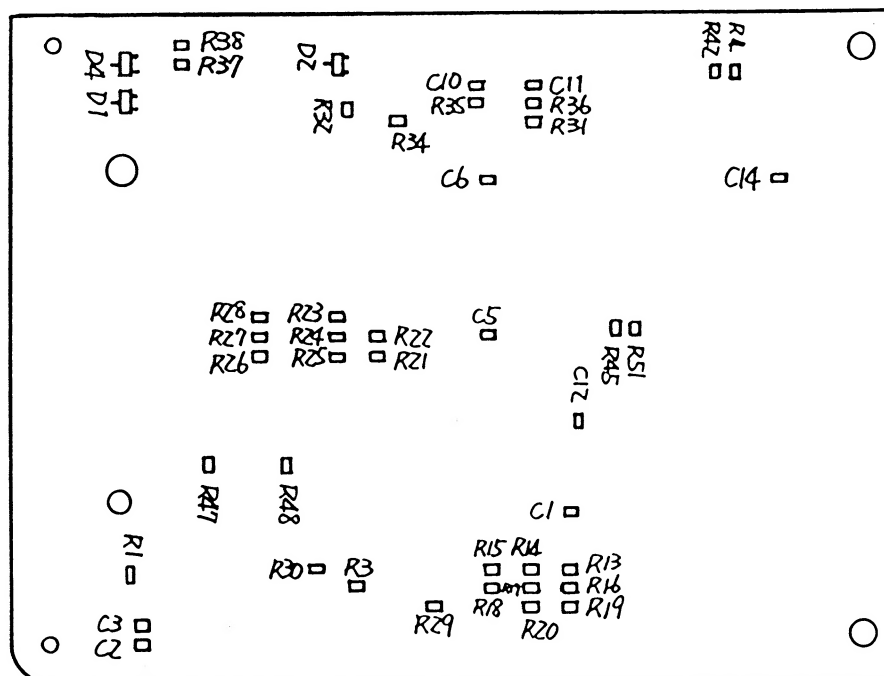
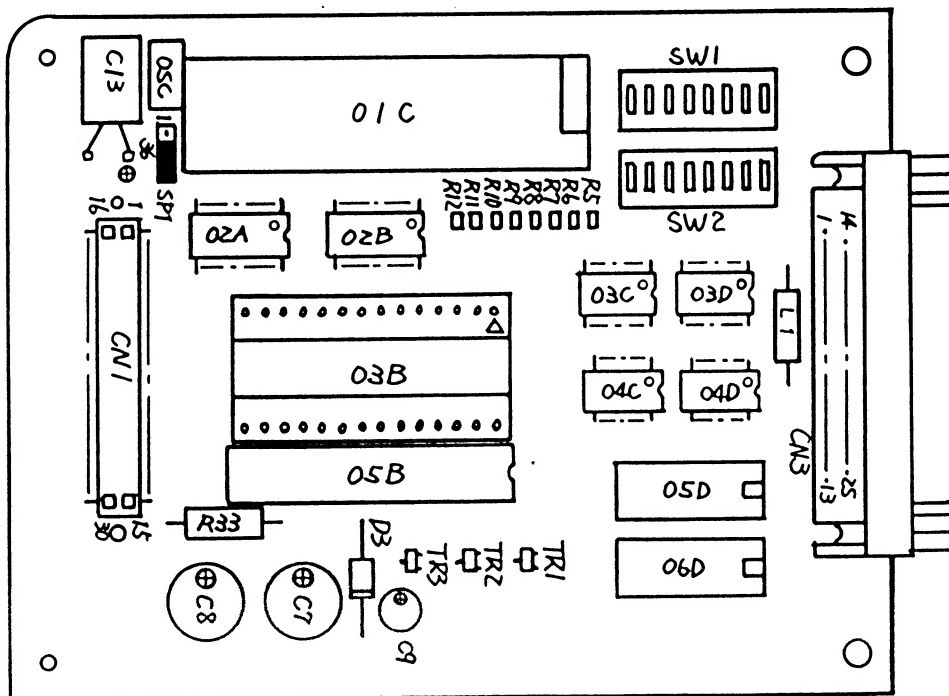
No.	Symbol	Type/Name	Part No.	Q'ty	Remark
1	D1	Diode-bridge RB602/S5VB20	4FP-24462	1	
2	D12	Diode-bridge RB402/S4VB20	4FP-24461	1	
3	D3	Diode ERC35-02/RG4Z	4FP-24460	1	
4	D17,18,20,21	Diode 1S2075①/1S1588/1S953	4FP-24207	4	
5	D9	Zener DI RD5.6EB	4FP-24005-3	1	
6	D10	Zener DI RD39EB6 or 7	4FP-24005-55	1	
7	D2	Thyristor TF821M/CR8AMW8/8P2M	4FP-24459	1	
8	R13,16	Resisitor,1/4W 100Ω, Carbon,±5%	4LP-8446-101	2	
9	R6	Resisitor,1/4W 220Ω, Carbon,±5%	4LP-8446-221	1	
10	R19	Resisitor,1/4W 430Ω, Carbon,±5%	4LP-8446-431	1	
11	R3,14,15	Resisitor,1/4W 560Ω, Carbon,±5%	4LP-8446-561	3	
12	R2	Resisitor,1/4W 1.2KΩ, Carbon,±5%	4LP-8446-122	1	
13	R29	Resisitor,1/4W 3KΩ, Carbon,±5%	4LP-8446-302	1	
14	R28	Resisitor,1/4W 10KΩ, Carbon,±5%	4LP-8446-103	1	
15	R27	Resisitor,1/4W 27KΩ, Carbon,±5%	4LP-8446-273	1	
16	R33	Resisitor,1/4W 680KΩ, Carbon,±5%	4LP-8446-684	1	
17	R31	Resisitor,1/4W 130KΩ, Carbon,±1%	323A1222F0131	1	
18	R11	Resisitor,1/4W 820KΩ, Carbon,±1%	323A1222F0821	1	

Printed Circuit Board (3YU5057-3311G1) 2/2 (2/3) REV. 1 PCB version 1

Symbol	Type/Name	Part No.	Q'ty	Remarks
R26	Resistor, 1/4W 910K Ω , Carbon, $\pm 1\%$	323A1222F0911	1	
R25	Resistor, 1/4W 1.3K Ω , Carbon, $\pm 1\%$	323A1222F0132	1	
R30,32	Resistor, 1/4W 3K Ω , Carbon, $\pm 1\%$	323A1222F0302	2	
R10	Resistor, 1/4W 27K Ω , Carbon, $\pm 1\%$	323A1222F0273	1	
R9	Resistor, 1/2W 100 Ω , Carbon, $\pm 5\%$	4FP-22113-101	1	
R12	Resistor, 2W 39K Ω , Carbon, $\pm 5\%$	4FP-22115-390	1	
R4	Resistor, 2W 5.6K Ω , Carbon, $\pm 5\%$	4FP-22115-562	1	
R1	Resistor, 2W 7.5K Ω , Carbon, $\pm 5\%$	4FP-22115-752	1	
R18	Resistor, 2W 3K Ω , Carbon, $\pm 5\%$	4FP-22068-302	1	
R21	Resistor, 5W 0.2 Ω , Carbon, $\pm 5\%$	4FP-22108-8	1	
C4	Capacitor 100V 0.001 μ F, Plastic, $\pm 10\%$	4FP-23044-35	1	
C13	Capacitor 100V 0.0015 μ F, Plastic, $\pm 10\%$	4FP-23044-36	1	
C3	Capacitor 250V 0.01 μ F, Prorcelamic, $+80\%/-20\%$	302A4027Z5103	1	
C2	Capacitor 50V 1 μ F, Elec, $+50\%/-10\%$	4FP-23012-57	1	
C17,18	Capacitor 50V 10 μ F, Elec, $+50\%/-10\%$	4FP-23012-61	2	
C9	Capacitor 10V 100 μ F, Elec, $+50\%/-10\%$	4FP-23012-12	1	
C5	Capacitor 50V 1000 μ F, Elec, $\pm 20\%$	4FP-23140	1	
C1	Capacitor 80V 3300 μ F, Elec, $\pm 20\%$	4FP-23139	1	
C7	Capacitor 16V 8200 μ F, Elec, $\pm 20\%$	4FP-23141	1	

SUII - Printed Circuit Board (3YU5057-3311G1) 2/2 (3/3) REV. 1 PCB version 1

No.	Symbol	Type/Name	Part No.	Q'ty	Remark
38	Q1	PNP Transistor 2SB1382/2SB1420	4FP-24494	1	
39	Q2	NPN Transistor 2SC1627/2SC2719	4FP-24486	1	
40	FB1	Beads B-20L-48B	4FP-21542-6	1	
41	L1	Coil SK-216N-060-550H	4FP-21566-2	1	
42	IC1	Regulator SI3052V	4FP-25074	1	
43	IC2	Regulator controller M5291P	4FP-25129	1	
44	IC3	Comparator PC339C/NJM2901	4FP-25166	1	
45	F1	Fuse MGC-2/61NM020H	4FP-21107-2	1	
46	FH1	Fuse holder TS-01-P-SN	4FP-21069	2	
48	H1	Heat sink	4FP-14110-5	1	
49	H2	Heat sink	4FP-14110-4	1	
50	CN1	Connector 172681-8	4FP-12836-8	1	
51	H3	Heat sink	4FP-14133	1	
52	J1,2,4,5	Jumper wire	4FP-22079-3	4	
53	J3,6	Jumper wire	4FP-22079-4	2	
56		Screw	+P(SW+2W)3-12-HHC	3	



MIIF - Printed Circuit Board (Option I/F Board)
(2YU5005-1726G1) 1/2 (1/1)

MIIF - Printed Circuit Board (Option I/F Board, 2YU5005-1726G1) 2/2 (1/2)

No.	Symbol	Type/Name	Part No.	Q'ty	Remark
1	D1	MA153 Signal DI (CP)	611A0029N0004	1	
2	D2,4	MA151WK/N202K/2838C Signal DI (CP)	611A0003N0003	2	
3	D3	RD10F-B Zener-DI	613A2232L0182	1	
4	R1	RM73B2A102J RN resistor (CP)	323A5003J0102	1	
5	R35	RM73B2A122J RN resistor (CP)	323A5003J0122	1	
6	R36-38	RM73B2A242J RN resistor (CP)	323A5003J0242	3	
7	R5-20	RM73B2A562J RN resistor (CP)	323A5003J0562	16	
8	R3,4,21-31, 42,48	RM73B2A103J RN resistor (CP)	323A5003J0103	15	
9	R32	RM73B2A203J RN resistor (CP)	323A5003J0203	1	
10	R34	RM73B2A474J RN resistor (CP)	323A5003J0474	1	
11	R33	RD1/2Y150ΩJ RN resistor	321A1431J0151	1	
12	R45,47,51	2125JPW Chip Jumper (CP)	323A5003P0001	3	
13	C1-3,5,6,10- 12,14	CK2012F1H104Z CK capacitor 50V (CP)	303A6008Z3104	9	
14	C9	CEUSM2A010 CE capacitor 100V 1.0UF	304A1041A2109	1	
15	C13	CEUSM1E470 CE capacitor 25V 47UF	304A1041E1470	1	
16	C7,8	CEUSM1E221 CE capacitor 25V 220UF	304A1041E1221	2	
17	01C	MSM80C51H-45RS MOS-CPU(ROM)	853A0135F0045	1	
18	02A	74LS245FP BIP digital IC (SO)	700A0503N0245	1	
19	02B	SN74LS373NS BIP digital IC (SO)	700A0550N0373	1	

Printed Circuit Board (Option I/F Board, 2YU5005-1726G1) 2/2 (2/2)

Symbol	Type/Name	Part No.	Q'ty	Remarks
03C,03D	74LS251FP BIP digital IC (SO)	700A0503N0251	2	
05B	HM6264ALSP-15 MOS-S-RAM	804A0021M6335	1	
04D	74LS32FP BIP digital IC (SO)	700A0503N0032	1	
04C	74LS06FP BIP digital IC (SO)	700A0503N0006	1	
06D	75188P BIP-INF-IC	710A0003M0188	1	
05D	75189P BIP-INF-IC	710A0003M0189	1	
TR1	A1344/UN2111/DTA114K PNP-HF-TR (CP)	600A1003N0003	1	
TR2	2SC3361/2SC2412K NPN-HF-TR (CP)	602A1003N0002	1	
TR3	2SA1331/2SA1037K PNP-HF-TR (CP)	600A1003N0002	1	
03B	DL2-28A-05 IC socket	245A1155P0280	1	
CN1	00-9072-230-901-883 PC connector	224A3377P0300	1	
CN3	D25S-LLD-6 hexagonal (#4-40) Square type connector	220A0121P0250	1	
SW1,2	BS8-01 DIP switch	206A1100P0800	2	
OSC	FAR-C4SB11059000-M02 Vibrator	4LP-12186-1	1	
L1	FBA04HA900KF-00 Bead core	105A1222C1001	1	
SP1	IMSA9202B-1-03Z013GF PC connector	224A4082P0030	1	
	IMSA-9206H-GF PC connector	224A4080P0020	1	